DOCUMENT RESUME

ED 252 981 EA 017 509

AUTHOR Picus, Larry; Holznagel, Donald
TITLE Electronic Communication Networks for Education: Policy Implications for SEAs. Discussion Draft.
INSTITUTION Northwest Regional Educational Lab., Portland, OR. Northwest Center for State Educational Policy Studies.
PUB DATE Jun 83
NOTE 30p.; Prepared for the Chief State School Officers of the Northwest and Pacific.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrators; Computer Assisted Instruction; Computer Oriented Programs; Databases; *Dial Access Information Systems; *Information Networks; Information Retrieval; Library Networks; Management Information Systems; Microcomputers; *Online Systems; *Policy Formation; School Districts; *State Departments of Education; State School District Relationship; *Telecommunications
IDENTIFIERS Database Producers; Data Transmission; Electronic Mail

ABSTRACT

Providing the chief state school officers of the Northwest and the Pacific states with information on the policy options they face in establishing an electronic communication system, this paper is divided into four sections. The first section describes potential uses of electronic communication networks in education for correspondence, management information, instruction, testing and evaluation, information base access, and database access. The second section describes the modes of operation for electronic communication networks and the capabilities of each mode. These include electronic mail, bulletin board, newsletter, document transmission, and data transmission. The third section discusses the technical considerations surrounding the establishment of an electronic communication network and considers the relative advantages and disadvantages of various configurations. The fourth section describes the policy issues a chief state school officer must consider in establishing an electronic communication network. This includes such issues as cost, operational control, privacy, user training, and the number of system users. (Author/MLF)

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ELECTRONIC COMMUNICATION NETWORKS FOR EDUCATION

Policy Implications for SEAs

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Discussion Draft

Prepared for the Chief State School Officers of the Northwest and Pacific

Larry Picus
Donald Bolznagel
Principal Authors

Northwest Center for State Educational Policy Studies
Northwest Regional Educational Laboratory
300 S.W. Sixth Avenue
Portland, Oregon 97204

June 1983

EA 017 509

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ABSTRACT

Nationwide, a number of State Education Agencies (SEAs) have taken advantage of the widespread availability of microcomputers in local school districts to establish electronic communication networks within their states. Because such networks offer a great deal of promise in improving communication between SEAs and their local school districts, many Chief State School Officers have expressed interest in establishing such networks in their own states.

This paper, prepared for the Chief State School Officers of the Northwest and the Pacific, discusses the issues and policy options facing Chiefs and their staffs as they consider the implementation of an electronic communication network for their state. The following topics are covered:

Uses: Before establishing an electronic communication network, it is important to determine how it will be used. Potential uses include:

1. Correspondence
2. Management Information
3. Instruction
4. Testing and Evaluation
5. Information Base Access
6. Data Base Access

Modes of Electronic Communication: There are a variety of operational modes for an electronic communication network. The particular mode chosen is largely dependent on how the system is to be used. The modes described in the paper include:

1. Electronic Mail
2. Bulletin Board

3. Newsletter

4. Document Transmission

5. Data Transmission

Technical Considerations: An electronic communication network requires three principal components--local user terminals, communication lines, and a central computer to switch messages. This section discusses possible options for each of these components, including the advantages and disadvantages of commercial networks and state operated networks. This section also describes the potential use of existing educational data processing cooperatives for an electronic communication network.

Operational Policies: The final section of the paper discusses policy issues and options that face an SEA in establishing an electronic communication network. These include:

1. Number of Users

2. Privacy

3. Cost Sharing

4. Type of Use

5. Operational Control

6. User Training

ELECTRONIC COMMUNICATION NETWORKS FOR EDUCATION

Policy Implications for SEAs

INTRODUCTION

Recent growth in the number and capabilities of electronic communication networks has dramatically increased the speed with which data and information can be transmitted to many different individuals. These technological advances have prompted many of the Chief State School Officers to consider installing communication networks within their states. In fact, many states have already begun the development of electronic communication networks between and among the Local Education Agencies (LEAs) and the State Education Agency (SEA).

Because state interest in developing this communication capability is growing as rapidly as are the options for installing such capability, the Chief State School Officers of the Northwest and the Pacific asked the staff of the Center for State Studies at the Northwest Regional Educational Laboratory (NWREL) to prepare a paper which describes the policy issues surrounding the development of an electronic communication network within a state.

Today, all 56 Chief State School Officers can get up-to-the-minute information about important national issues in education by "reading" the electronic CHIEFILE newsletter prepared by the Council of Chief State School Officers. Using their Texas Instruments microcomputers, or other machines, each Chief has daily access to this important source of information. CHIEFILE is only one of a large, and growing, number of electronic newsletters that the Chiefs and their staff can access through

a service known as EDNET. Because EDNET is a part of a larger organization called THE SOURCE, individuals with access to EDNET can also access a variety of other services including the news from UPI's News Service, airline schedules, restaurant information and many others.

Three SEAs, Connecticut, Arkansas and Pennsylvania, have started electronic communication networks using the EDNET system. Four other states, Ohio, Alabama, Kansas and Wisconsin, have School Board Association networks operating through EDNET. Another communication network, SPECIAL NET offers individual states "bulletin boards" and "electronic mail" service through the Telenet System. At this time, Florida has two SPECIAL NET bulletin boards that reach all 67 school districts in the state. Over 20 other states have their own SPECIAL NET bulletin board. In Alaska, the State Department of Education sponsored the establishment of an electronic mail system with terminals in all 52 school districts in the state. Unlike the other systems, Alaska's operates through a computer owned and operated by the state.

To provide the Chiefs with information on the policy options they face in establishing an electronic communication system, this paper is divided into four sections. The first section describes potential uses of electronic communication networks in education. This section points out that it is essential to decide how the network will be used, before making decisions regarding the technical aspects of the system.

The second section of the paper describes the modes of operation for electronic communication networks, and the capabilities of each mode. The third section discusses the technical considerations surrounding the establishment of an electronic communication network and considers the

relative advantages and disadvantages of various configurations. Options available include installation of a state owned and operated computer system, purchase of software for a communication network to run on an existing state computer, or a subscription to one of the commercial systems already in existence. The fourth section of this paper describes the policy issues which a Chief State School Officer must consider in establishing an electronic communication network. This includes such issues as cost, operational control, privacy, user training, and the number of system users.

USES OF ELECTRONIC COMMUNICATION NETWORKS

During NWREL's interviews with state officials responsible for the design, implementation and operation of communication networks, it became clear that the most important decision point in establishing a network is how it will be used. These decisions are critical to determining both the network's operating configuration, and how much use it will receive. NWREL found a wide variety of uses and potential uses for networks. In general, these uses can be divided into the following six categories:

1. Correspondence
2. Management Information
3. Instruction
4. Testing and Evaluation
5. Information Base Access
6. Data Base Access

Each of these six categories are discussed in more depth below.

1. Correspondence. Correspondence functions are the most frequently thought of use for electronic communication networks. Many "electronic mail systems" are designed primarily for correspondence, and all of the statewide systems reviewed for this report contain mechanisms that allow correspondence between and/or among users. The major functions within this category include the following:

   a. Bulletins or memoranda from the SEA to local agencies.

   b. Bulletin boards allowing users to post general interest messages to all other users. Responsibility for removing notices from a bulletin board is usually vested in one agency, most likely the SEA.

   c. Legislative and legal updates and information.

d. Calendar of events.

e. Conducting surveys or polls of users. This is a particularly powerful tool for finding out what school superintendents or other groups think of newly proposed legislation, regulations, or similar state proposals.

f. Individually addressed correspondence where one user sends a specific message to other individuals or small groups of users.

2. Management Information. The vast majority of school districts in the United States utilize computers to assist with management functions such as budgeting, accounting and reporting. In many states, there are cooperatives that provide these services to member school districts through remote terminal communications. While the requirements of a management system differ from those of a communication network, the two functions could easily operate on the same hardware. (This possibility is discussed in more depth in the technical considerations section.)

The SEA operated communication networks identified by NWREL as including management information capabilities use a newsletter format to send information to LEAs. Examples of this include the "Facts and Figures" service of the Pennsylvania network, PENN*LINK, and the Ohio School Boards Association's (Ohio-Link) "Cost of Living" service which provides data on the Consumer Price Index. Both are new options in their respective networks, and are designed to provide information that the sponsors think will be useful to network and subscribers.

The real value of a communication network for management information is the capacity to tranfer cost, budget, accounting, personnel and other management data between the user and the central computer. In fact, representatives of the SEAs with electronic networks indicated that a frequent request on the part of users is the ability to "flow data."

This capability is a logical outgrowth of a communication network. In many states, data processing cooperatives have been established to help districts with management data processing. There are many advantages to electronic data transfer of management information, including the remote entry of data for state reports which would eliminate the need for SEA keypunching of the data.

3. Instruction. Computer Assisted Instruction (CAI) can be provided either with stand-alone microcomputers, or through a timesharing system operated through a central computer using a network similar to that required for electronic mail and similar services. While communication costs often make statewide timeshare systems expensive, many local school districts or intermediate education agencies provide timesharing instructional services to schools. The Minnesota Educational Computing Consortium (MECC) has operated one of the most successful instructional timesharing networks in the nation, largely through state subsidization of the communications costs. In recent years, the state subsidy has dwindled, limiting LEA use of the instructional timeshare network. In addition, the rapid increase in microcomputer purchases by schools has eroded the use of the timeshare network.

In Indiana, an electronic communication network is being used to share curriculum materials. The state supports a network of nine regional centers with terminals allowing each center to communicate with the SEA and with other regional centers. Instructional materials can be transferred from one site to another, and resource people located in each region serve as linkers, providing information retrieval, information base searching and other services for the school districts in their region.

Officials in Oregon, who provide copies of disks with instructional material for use on microcomputers to school districts at cost (this includes licensing when required), think that the ability to transfer the data on disks via a communication link could save the time and effort involved in copying the disks, mailing them and billing school districts for materials, licensing and postage. This disk to disk copying would only be cost effective if transmission rates were fast enough to keep the communications charges relatively low. In Minnesota, a similar distribution scheme received little use in actual practice.

4. Testing and Evaluation. Although NWREL's investigation did not discover any states currently using communication networks for testing and evaluation, a number of potential uses were identified. In Oregon, the Oregon Total Information Service (OTIS), a cooperative serving approximately one-third of the school districts in the state, has looked into the possibility of entering test data via remote terminal and reporting scores back to the districts electronically. The biggest obstacle OTIS seems to face is determining which test instruments will meet the needs of the largest number of cooperative members.

Other potential uses of electronic networks for testing and evaluation include using a central data processing facility to store and make available information on items such as Chapter I evaluation results and standardized test instruments. It may also be possible to use a network to access socioeconomic data available in a large computer and correlate that information with testing and evaluation data.

5. Information Base Access. One of the most powerful uses of electronic communication networks in local school districts is the ability to search electronic information bases such as ERIC and NWREL's Resources in Computer Education (RICE). While there is generally a user charge associated with these data bases, any school district with a terminal can gain access to the information they contain.

In Washington, the data processing cooperative operated by ESD 189 is exploring the possibility of indexing the state's education laws and regulations, and making both the index and the actual text available via terminal.

Although frequently expensive to develop and maintain, if properly used, electronic information bases have the potential to bring many additional resources to local schools.

6. Data Base Access. While information bases deal with synthesized data, studies and documents, data bases contain accessible raw data. The State of New Jersey has recently finished development of statewide data base containing a wide variety of financial, personnel, student and achievement data. This data base can be accessed by any individual who desires to do so and who obtains an identification number. Users can currently access any of the data available in the state's data base. System designers hope that in the near future, districts will be able to update the data base either through local terminals, or by submitting a tape to the SEA.

Data base systems are standard operational procedures for most of the data processing cooperatives today, and development of additional data bases with information useful to many educational interest groups is a potentially very powerful use of communication networks in the future.

MODES OF ELECTRONIC COMMUNICATION

Because each of the uses identified above makes differing demands on computer equipment, there are a number of different modes of operation for electronic communications. NWREL has identified five different operational modes as follows:

1. Electronic Mail
2. Bulletin Boards
3. Newsletters
4. Document Transmission
5. Data Transmission

A description of each operational mode is included below. Following this description there is a matrix which identifies which mode or modes are most appropriate for each of the uses described above.

1. Electronic Mail. An electronic mail system (EMS) is designed to allow an individual to send messages (notes, memos, letters) to one person, several persons or to a large group. Each person or agency in the system has an address. A message can be sent to one address, all addresses, or to a subgroup of a few addresses having a special code. The message can be read only by the sender and addressees. The messages can be sent at a time convenient to the sender, and read at a time convenient to the receiver. The type of message and audience are controlled by the sender. Messages are removed either when received, or through a specific command from the addressee.

2. Bulletin Board. An electronic bulletin board is designed to allow anyone with access to the system to post a message (note, memo, announcement, open letter) in a place from which all can read. Messages

are usually removed from the board automatically according to a date (e.g., all five-day old messages deleted daily), and can always be removed by the originator.

3. Newsletter. An electronic newsletter is an edited, organized and controlled version of the bulletin board. That is, everyone in the network has access to read the information, but information to be included is submitted to an editor. The newsletter usually has a table of contents structured as a menu. The reader chooses an article by selecting the appropriate item number, or if desired, can read the whole newsletter sequentially. The content of the newsletter changes daily or weekly based on a set schedule. In some newsletters, an article of particular importance may be carried over for several periods.

4. Document Transmission. This mode of communication involves transfer of a high volume of printed information, such as a booklet, report, contract or other document. It can be done in several ways. First, the document contents can be sent like a long letter to an electronic mail address, or it can be placed as an article in a newsletter. Most often document transmission is done by storing the contents in a word processing sytem and transmitting the contents to another word processing system for printing at a later time. Sometimes, document transmission implies facsimile transmission, where special scanning equipment is needed on the sending end, and a special printer is needed on the receiving end. Document transmission is usually direct from reader to receiver online, and does not require a central computer to transfer messages as is required with bulletin board, mail and newsletters.

5. Data Transmission. In this mode, data is collected and transmitted in large batches such as student test responses, or in small batches such as data entered on a keyboard in response to a question. Data can be sent to a file on a computer, or can be sent from a computer file to a terminal on request. For extremely large quantities of data, specifically conditioned transmission lines operating at high transmission rates (960 characters per second or higher) are used. At low rates (30 to 120 characters per second), ordinary voice telephone lines can be used.

MATRIX COMPARING COMMUNICATION
NETWORK USES WITH OPERATIONAL MODES

USE	Electronic Mail	Bulletin Board	News-ltrs	Data Trans	Doc Trans
CORRESPONDENCE					
Memoranda, Announcements and Bulletins from the SEA	X	X	X		
Legislative/Legal Updates		X			
Calendar of Events			X		
Surveys and Polls (Responses)	X				
Correspondence Between and Among Individual Users	X				
Reports, Reaction Drafts, etc.					X
MANAGEMENT INFORMATION					
Information (Facts & Figures)			X	X	
State Reports				X	X
Management Data Processing				X	
INSTRUCTION					
Instructional Timeshare				X	
Share Curriculum Materials			X	X	
TESTING AND EVALUATION					
Data Entry and Retrieval				X	
Combining Test Data with Socioeconomic Data				X	
INFORMATION BASE ACCESS					
Searches				X	
Index of State Laws				X	
DATA BASE ACCESS					
Access and Manipulation of Data				X	X
Add to Statewide Data				X	X

TECHNICAL CONSIDERATIONS

The operation of an electronic communication network requires three basic components--a user terminal, a central computer to receive and distribute messages, and a communication link between the users and the central computer. There are a variety of ways in which a state can establish a network. This description starts with the center of the network and works its way out to the user terminals to describe the possible options.

Once an SEA has determined what services it wants to provide via an electronic communication network, it must install the hardware to provide those services. To do this, the SEA can look either to a commercial vendor, or it can develop its own state system. The options, and the issues surrounding each are discussed below.

There are a variety of commercial communication network vendors in existence today, and many more coming "on-line" in the near future. Two frequently used networks for educational agencies are ED NET, operated by THE SOURCE, and SPECIAL NET, operated by the National Association of State Directors of Special Education through the Telenet system. To use either of these sytems, an LEA need only have a terminal with a modem, and an identification number. Both firms charge a subscription fee and/or an initial hookup fee. Once a user has an identification number, he or she can access any information available through that network, unless it is specifically limited to certain users. For example, when using EDNET, NWREL discovered that it is not authorized to review the file for the Wisconsin Association of School Boards.

EDNET has a total of seven state networks, in addition to two national files, one for the Council of Chief State School Officers and the other for the National Association of State Boards of Education. The other major system, SPECIAL NET was originally started as a network for State Directors of Special Education. However, a number of state "bulletin boards" have been established, not all of which are limited to special education. In Florida, there are two, one for special education directors and one for school superintendents, both of which serve every district in the state. In NWREL's region, Montana has a statewide bulletin board within SPECIAL NET, although there are only 20-30 school districts participating in the network at the present time.

Bibliographic Retrieval Services (BRS), a firm which up to now has specialized in providing access to data bases such as ERIC and RICE, will offer a communication network in the near future. Discussions with an official of that firm's educational services department indicated that BRS hopes to have a "state of the art" electronic mail and communications system in place by October of this year. Since many of the SEAs in the United States already have subscriptions to BRS services, the addition of this communication service will expand the commercial network options for SEAs.

Another major entry into the race is Western Union with its Easy Link facility. While not primarily targeted for the educational market, it certainly should be considered for national and international communication systems.

The major advantage in utilizing one of the commercial vendors for an electronic communication network is that the state is not responsible for procurement, maintenance and operation of the system's hardware and software. The SEA is responsible for development of the information

entered into the network, and also responsible for monitoring bulletins to insure that out-of-date messages are removed from the system.

A second advantage is the ease with which users can enter the system. The conventions for establishing a terminal to use with the commercial vendors are very simple, and software is available to make most microcomputers operate as a terminal. In addition, once a school district has paid its subscription fee, it has access to all of the services available through that particular network. This "value added" concept is a strong point in favor of the national service vendors.

One of the difficulties with use of a major commercial vendor (THE SOURCE, BRS, Western Union and Telenet are only four of a number offering these services) is the fact that not all school districts in a state may choose to belong to the network. None of the states using EDNET has a 100% membership in the system at the present time, and in Arkansas, there seems to be a general feeling that further evaluation and refinement of the network's use is required before districts will be willing to pay the costs associated with membership in that state's EDNET network.

Another drawback to the use of a commercial vendor is the limited ability to utilize the system for management needs, something that appears to be popular with LEAs. System limitations prevent large scale transfer of data at the present time, and communication costs (discussed in depth below) make such operations extremely expensive. However, both AT&T and IBM are in the process of establishing communication networks that may alleviate some of these weaknesses in the current generation of communication facilities.

In all three of the states with EDNET systems operated by the SEA, officials indicated that they would look at establishing their own state system in the future. These officials indicated that they started with a commercial vendor because it was the simplest and least expensive option, but that once user needs have been more carefully assessed and defined, a state system, similar to that operated by the State of Alaska, would probably be better.

At the current time, the only state that operates its own network is Alaska. A state operated network can be established through a computer installed at the SEA, a university, or at an existing data processing cooperative in a state. In Washington, the computing cooperative operated through ESD 189 is beginning an electronic mail system experiment with nine ESDs and six member school districts. During its initial phase, use patterns and computer capacity will be tested to determine whether or not the EMS can be expanded to all of the cooperative's member districts. Because the cooperative serves 260 of the state's 300 school districts, full EMS service would make Washington's one of the most comprehensive systems in the nation.

In Oregon, the OTIS system has looked into EMS and it is likely that sometime in the near future this service will be available to member districts. At the present time, OTIS serves about one-third of the school districts in the state. In Idaho, the state operates a cooperative for school district financial and student services. A total of 60 of the 116 districts in the state receive services from this cooperative. Although establishment of a communication network has received little attention to date, it may be an issue in the future. It is clear that any state considering a communication network should review

the capabilities and membership pattern of data processing cooperatives already in existence within their state prior to making a decision about the type of hardware to purchase.

The major advantage of a state owned and operated system (or a system operated through a state cooperative) is that it gives state officials greater control over the capabilities and uses of the system. On the other hand, it also requires state operation and maintenance of the system hardware and software to insure it functions properly. In addition, use of a state operated network limits the ability of local school districts to tap into the national networks, unless they are willing to expend additional funds for a subscription to one or more of the networks as well.

A critical factor that will impact the design of the communication hardware is communication costs. Electronic communication networks typically rely on telephone lines for data transmission. The greater the distance a call must be placed, the more expensive access to the system becomes.

This problem is minor in larger urban areas through the use of communications services such as Telenet, Tymnet and Uninet, which provide a local phone number for their users. Phone charges are included in the user's bill for the network services and are generally quite low ($6.00 to $11.00 per hour). However, when a user is located out of the range of one of these local call areas, he or she must either call the data base directly, or make a long distance call to the nearest Telenet, or other service number. This has a dramatic impact on communication costs. These high costs, if paid by local school districts, can reduce the willingness of LEAs to participate in a communication network.

There is little that can be done to eliminate communication costs, but there are a number of options for minimizing them. SPECIAL NET offers an 800 number for users to call. The billing rate for this number is $23.00 per hour, considerably less than the long distance rates for many school districts in remote rural areas. Another option is for the state to subsidize the communication costs. MECC's timeshare network was supported by state subsidies for communications until recently.

Many of the state data processing cooperatives have devised systems to share these communication costs evenly among all members. Most cooperatives charge members a flat rate per student for the services they offer. As part of the service package, the cooperative provides and pays for a communication line between the user and the cooperative's computer. Because each user pays the same fee for data processing services--generally a flat, per pupil fee--regardless of the expense of communication lines, the costs are effectively shared among all cooperative members.

In addition to the use of telephone lines, microwave communications can also be used to transmit information between users. The system of Higher Education in Idaho uses the microwave transmission capabilities of the state's public television stations (also university operated) to send electronic messages between the three major campuses. While the system is less expensive than a dedicated phone line, it is also less reliable. At the time NWREL talked with officials in Idaho, the system was down and not expected to be operational until the repair person returned from vacation in a week. It was estimated that conversion to a dedicated phone line would cost an additional $7,000 a year, an expense which the system's management has been unwilling to make up to this point.

The final technical issue to be resolved is the purchase of terminals in the LEAs. Most microcomputers can be set up to operate as a terminal provided they have the proper communications equipment which includes a modem and software to make the microcomputer emulate a terminal. In general, most states require the local districts to purchase their own terminal or microcomputer to access the system. However, since states cannot force school districts to purchase computers or terminals, there is no way to guarantee that all districts will have access to the system. In Alaska, this problem was resolved when the state purchased an Apple II computer for each school district for the purpose of using the Electronic Mail Network there. Once purchased, a microcomputer can be used for a number of other applications, including instruction, in addition to serving as a terminal for a communication network.

OPERATIONAL POLICIES

As the previous three sections have demonstrated, there is a range of alternatives that must be considered before a communication network can be established among SEAs in a state. From these alternatives come a number of policy options which a Chief and his staff must consider. These can be divided into the following six categories:

1. Number of Users
2. Privacy
3. Cost Sharing
4. Type of Use
5. Operational Control
6. User Training

Each is discussed briefly below.

1. Number of Users. A critical issue for the SEA to resolve is the number of LEA system users. If the communication network is going to be used to replace traditional mail for SEA bulletins and memoranda, then it is essential that all of the districts in the state have access to the system. If there is not 100% LEA membership, then the SEA will have to duplicate its informational efforts and mail out printed copy to all of the districts in addition to using the network. Chiefs may consider the option of purchasing a terminal for each distict, but this could be prohibitively expensive.

An outgrowth of the need to have 100% membership in a system, if it is to replace current mail practices, is the importance of having each user check his or her messages on a regular (i.e., daily) basis. Unless

all users do so, the time value of the information is limited. In addition, the SEA is faced with the same problem it would face if less than 100% of the local districts were members of the network, and is forced to find a way to insure that all districts receive the information that the SEA feels they should have.

With the exception of the SPECIAL NET bulletin boards in Florida and the Alaska EMS system, there do not appear to be any other states that have 100% network membership in a communication system. None of the three SEA networks operating in EDNET has even a majority of the school districts participating in the system to date. Consequently, the approach taken to installation of terminals--local contribution, SEA supplied, or state/local sharing of the costs of purchasing a terminal--should receive careful consideration.

2. Privacy. It is likely that when fully implemented, a communication network could be used to transmit confidential information. Therefore, it is essential that privacy considerations be built into the system. An electronic mail system which allows a user to send messages only to specific mailboxes can help meet this criteria, but there are still issues of access to the central computer's files, and concern over who reads a school district's mail each day. It will be necessary to work out procedures to insure that confidential information sent via electronic communication networks remains in the hands of its intended audience if the SEA wishes to use a network for this type of information. A statewide policy on confidential communications, either banning them, or establishing guidelines for confidential communications, may be required.

3. Cost Sharing. Short of the number of users issue, this may be the most critical policy concern facing the development of a successful communication network within a state. Traditionally, states have required local school districts to purchase their own microcomputer or terminal, and pay for all communication costs. As a result, many of the remote rural school districts have elected not to participate in those networks, limiting the usefulness of the system. Alaska solved this problem by providing microcomputers to all of the school districts, and in Minnesota, MECC subsidized communications costs. It was apparent to NWREL staff that the higher the cost to the local school district, the less likely the district was to participate in an electronic network. Resolving the communications cost issue will be critical to the success of future systems.

While there are a number of possible ways to minimize communication costs--including use of 800 numbers, cost subsidies, negotiation of additional Telenet, Tymnet, Uninet or similar trunk lines, or possible microwave transmission--all have some costs associated with their use. Until SEAs and LEAs are prepared to pay those communication costs, there will be limits to the success of electronic communication.

It appears that the options facing an SEA include the following:

a. Leave it up to the local school districts to pay for all communication costs, but assist in helping minimize those costs through establishment of an 800 number if it will reduce costs for some districts.

b. Subsidize communication costs, by paying a portion of costs incurred by local school districts.

c. Pay 100% of the local communication costs, either through a subsidy plan, or an 800 number where locals are not billed for communication costs.

d. Establish a system that charges school districts for communications based on a flat rate per pupil, effectively sharing the costs among all districts in the state.

4. Type of Use. While the potential uses of a communication network were discussed above, this critical policy issue must be considered before a network is established. It must be determined if the major purpose of the system is to monitor LEA performance, provide technical assistance, or simply be a source of information between the SEA and LEAs.

If the SEA intends to monitor LEA performance, then the system will probably need to have the capacity to handle large quantities of data as LEAs begin to submit reports via the communication network. If the state is going to require such submission, it is likely that it will also have to consider paying some if not all of the communication costs associated with the system.

If the SEA plans to use the system to provide technical assistance in various areas, it will be important that the types of assistance be widely publicized, and that the information provided to LEAs be timely and accurate. If technical assistance is the primary or only system objective, then it may be possible to use a "branching" model with less than 100% district membership.

Finally, if the purpose of the system is for information flow, then its success will be directly dependent on the number of districts that participate. If the state is still forced to print and mail copies of all notices that are sent via electronic mail, then the potential fiscal savings of an electronic network will be lost, and the total information costs to school districts and the SEA might actually increase.

5. Operational Control. An important decision that must be made in establishing an electronic communication network is where operational control will be located. If the SEA contracts with one of the major

commercial vendors, it is important to insure that the contract agreement allows the SEA to operate the system in the manner it has defined. It is important that the SEA weigh the system limitations (if any) with the convenience of having someone else responsible for the operation and maintenance of the hardware and software.

If the SEA maintains full control of the system, it is important that proper measures be taken to insure that it will operate properly with a minimum of down time. While SEA operation will give the state maximum control over the system, it could also result in the system getting "lost" in the state bureaucracy, with a resultant loss of interest in its success by participants. This appears to have happened in Alaska where operation of the EMS system was turned over to an operational division within the State Department, and is now threatened with a substantial funding loss that will weaken its capabilities dramatically.

Finally, if the system is operated by a cooperative, it is important that arrangements be made so that LEAs that are not members of the cooperative have access to the communication network. Another important policy issue is insuring SEA access to the network for distributing information and other important documents to LEAs. Again, consideration must be given to the ability of the system to reach all of the LEAs in the state if it is to operate to its maximum potential.

6. User Training. A final, yet important issue is to insure that there are individuals at each network location who know how to use the system. While most networks are generally simple to access and require little instruction to operate properly, many people are still intimidated by computers, and require personal assistance to become comfortable with their operation. Proper user training will be essential to insure that a statewide electronic communication network will operate successfully.

To conclude, there are a number of important policy issues and options which must be considered prior to the establishment of an electronic communication network. This paper has described the policy decisions that must be made by an SEA before a network can be established, and provided information to help SEA decision makers choose among the various options available today.